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PAR 255

Preparation of Simulations of High-Altitude Aerial Photography

13 February 1970

NGA Review Complete

PROJECT AUTHORIZATION REQUEST

PAR 255
13 Feb 70

SUBJECT: Preparation of Simulations of High-Altitude Aerial Photography

TASK/PROBLEM

1. Prepare simulated black-and-white aerial negatives and dupes from original photography provided by the customer. Simulations shall depict [redacted] photography with ground resolution [redacted] 25X1

25X1 [redacted]

PROPOSAL

2. Introduction. It is proposed that the contractor furnish simulations in accordance with customer requirements described herein. This contractor has demonstrated the capability of producing negatives which simulate high-altitude aerial photography in which tone reproduction, limiting resolution, and modulation transfer functions can be controlled in negatives of various scales on any aerial negative product.

3. Background. On 3 February 1970, two customer representatives met with the contractor to discuss simulation requirements. The customer requires duplicate positives from negatives on Type 3404 film having ground

25X1 resolution [redacted] The negatives would be made from a single low-altitude photograph of the tank museum at Aberdeen Proving Grounds. The contractor described the procedure for preparing simulations and their limitations. Agreement was reached that simulations meeting the customer's requirements could be produced by the contractor.

4. Approach:

a. For this effort the customer will supply the following:

(1) An original negative on Type 3404 film at about 2000:1 scale showing ground resolution [redacted] 25X

(2) Sensitometric data relative to the negative.

(3) Ground truth data and target calibration data relative to the photograph.

(4) Flight data.

(5) Frames adjacent to the preferred scene which contain images of the ground targets.

b. The contractor will produce negatives from the original negative using laboratory cameras to simulate high-altitude photography of the scene. Tone reproduction will be controlled to represent nominal haze conditions. Image quality will be controlled to demonstrate limiting ground resolution only; system MTF, scale, and typical limiting film resolution will not be simulated. For customer requirements the final image size must exceed 0.2 inch, limiting reductions to 10X in making images with lower ground resolution. The scales in the negatives will not vary by more than a factor of 4. Degradation of imagery to obtain the correct ground resolution (film resolution) will be accomplished by varying the lens f/no. in making the reduced negatives.

OBJECTIVES

5. The contractor will prepare and deliver one simulated aerial negative on Type 3404 film of each of the types listed below:

Negative No.	Scale*
1	5000:1
2	10,000:1
3	15,000:1
4	20,000:1
5	20,000:1

25X

* The exact values will be determined after evaluation of the original negative.

6. The contractor will also furnish three contact positive transparencies on 2430 film from each negative. The positives will be sandwiched in clear plastic with an opaque mask outside the image area.

7. A final report will be submitted that describes in detail the procedure followed in preparing the simulations and the characteristics of each image.

SCHEDULE

8. All simulations (images) will be delivered to the customer within 6 weeks (30 working days) of receipt of the original negatives and other necessary information from the customer. Data describing the simulation characteristics will be delivered with the images. The final report will be submitted within three weeks after delivery of the images. A tentative schedule covering the major phases of effort is shown in Figure 1.

TENTATIVE SCHEDULE

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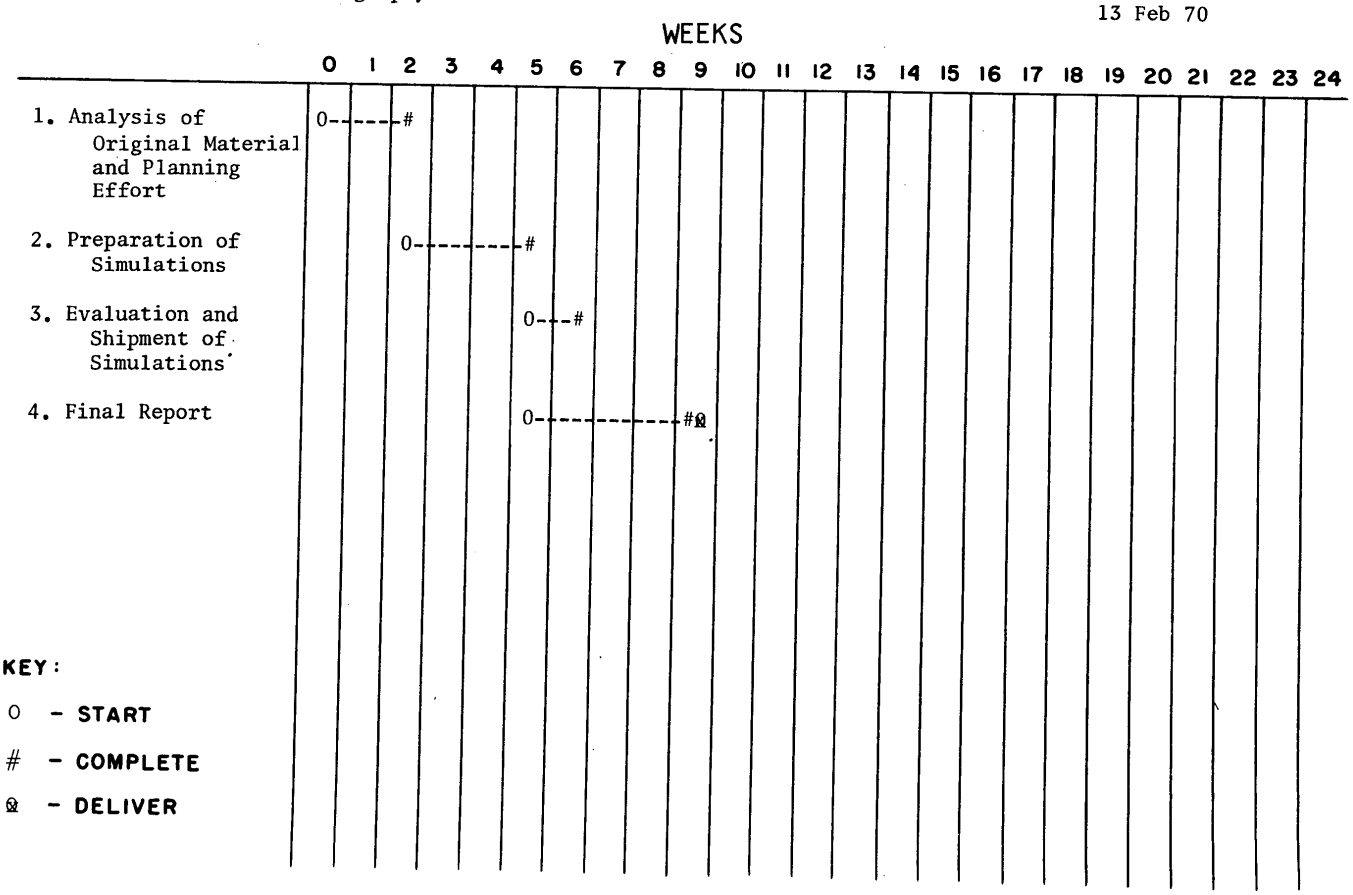

KEY:

0 - START

- COMPLETE

Ø - DELIVER